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Flying Operations

MQ-1--OPERATIONS PROCEDURES

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This volume implements AFPD 11-2, *Aircraft Rules and Procedures*; AFPD 11-4, *Aviation Service*; and AFI 11-202V3, *General Flight Rules*. This volume prescribes standard operations procedures for United States Air Force (USAF) MQ-1 aircraft and applies to all MQ-1 units to include Air Force Reserve Command (AFRC) and Air National Guard (ANG). Major commands (MAJCOMs), Direct Reporting Units (DRUs), and Field Operating Agencies (FOAs) will forward proposed supplements to this volume to Headquarters (HQ) USAF/A3O-AT through HQ Air Combat Command (ACC)/A3YU for approval prior to publication in accordance with (IAW) AFPD 11-2. Copies of MAJCOM, DRU, and FOA-level supplements, after approved and published, will be provided by the issuing activity to HQ USAF/A3O-AT, HQ ACC/A3YU, and the user MAJCOM, DRU, or FOA and National Guard Bureau (NGB) offices of primary responsibility (OPR). Field units below MAJCOM, DRU, and FOA-level will forward copies of their supplements to this volume to their parent organization OPR for post-publication review. NOTE: The terms DRU and FOA used in this paragraph refer only to those DRUs and FOAs that report directly to HQ USAF. Maintain supplement currency by complying with AFI 33-360, Publications and Forms Management. See paragraph **1.4.** of this volume for guidance on submitting comments and suggesting improvements to this publication. Headquarters (HQ) Air Combat Command (ACC) will forward proposed major command (MAJCOM) supplements to this volume to HQ Air Force Flight Standards Agency (HQ AFFSA/A3O (AJW31AF) Bldg 4, Room 107, 6500 South MacArthur Blvd, Oklahoma City, OK 73169 DSN 339-9000) for approval prior to publication in accordance with (IAW) AFPD 11-2, paragraph **4.2.** HQ ACC will provide a copy of approved and published MAJCOM-level supplements to HQ AFFSA/A3O. Submit suggested improvements to this publication on AF Form 847, *Recommendation for Change of Publication*, through channels to HQ ACC/A3TV, 205 Dodd Blvd, Ste 101, Langley AFB, VA 23665-2789. ACC/A3TV will staff/consolidate recommended changes and forward proposed interim changes to HQ AFFSA/A3O. HQ USAF/A3/A5 is the approval authority for changes to this publication. The reporting requirements in this volume are exempt from licensing IAW paragraph 2.11.10 of AFI 33-324, *The Information Collections Reports Management Program; Controlling Internal, Public, and*

Interagency Air Force Information Collections. The Paperwork Reduction Act of 1974 as amended in 1996 and the Air Force Forms Management Program IAW AFI 33-360 affect this volume.

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SUMMARY OF CHANGES

This document has been substantially revised and must be completely reviewed. Major changes include: all references to RQ-1 changed to MQ-1. Para **1.1.** removed. Para **1.1.2.** updates aircrew responsibilities. Para **1.1.4.** adds reference publications. Para **1.1.5**. clarifies phase manual procedures. Para **1.3.1** thru para **1.3.6**. removed. Para **1.3.** clarifies operations procedures for aircrew using equipment without properly validated technical data. Para **1.2.** Specifies waiver authority for units OPCON'd to a COMAFOR. Para **2.1.** clarifies responsibilities. Para **2.1.1.** and para **2.1.2.** further clarify responsibilities. Para **2.2.** changed to General Procedures. Para **2.2.** specifies pilot-in-command as responsible for appropriate FLIP pubs in GCS. Para **2.3.2.** clarifies chart requirements. Para **2.3.3.** DEMPC reference removed. Para **2.3.2.** briefing times changed. Para **2.3.3.** mission brief requirements changed. Para **2.4.4**. DEMPC reference removed. Para **2.4.3.4**. removed. Para **2.4.5**. removed. Para **2.4.6**. removed. Para **3.1.1.** defines Pilot In Command. Para **3.1.3.** thru para **3.1.7**. moved to para **3.2.** Para **3.2.** changed to para **3.3.** Para **3.3.4.** adds requirement for an operational radio suitable for mission accomplishment. Para **3.4.2.2.** combines old para **3.3.2.2**. and **3.3.2.3**. Para **3.5.** defines requirements for checklist usage. Para **3.8.1.** adds TOLD calculation requirements. Para **3.9.1.** added to clarify display of flight graphics and define operations checks. Para **3.10.1.** added requirement to brief approach and landing speeds. Para **3.10.1.** thru **3.10.9.** renumbered. Para **3.10.7.** clarifies night EO landing and approach procedures. Para **3.12.1.** Joker fuel definition added. Para **3.12.2.** Bingo fuel definition added. Para **3.12.2.1.** Recovery fuel redefined. Para **3.12.2.2.** Minimum/emergency fuel added. Para. **3.12.2.2.1.** Minimum fuel defined. Para **3.12.2.2.2.** Emergency fuel defined. Para **3.12.3.** added for operations below recovery fuel. Para **4.2.1.** information incorporated into **Table 4.1**. Para **4.2.1.2**. deleted. Para **4.2.2.** added resource requirement for alternate airfield. Para **4.3.1.** turbulence limitations redefined. Para **4.3.2.** added requirement to limit exposure to turbulent conditions. Para **4.2.3.1**. deleted. Para **4.6.1.1.3.** changed to different verbiage. Para **4.6.1.1.** changed to read General (all configurations). **Chapter 5** changed to Air To-Air-Weapons Employment. Old **Chapter 5** moved to **Chapter 7**. **Chapter 6** changed to Air-To-Ground Weapons Employment. Old **Chapter 6** moved to **Chapter 8. Para 6.1.** thru **6.5.** added. **Chapter 7,** Abnormal Operating Procedures added. **Chapter 8**, Local Procedures added. Previous **Attachment 5, 7**, and **8** deleted.

This publication requires the collection and/or maintenance of information protected by the Privacy Act (PA) of 1974. The authorities to collect and/or maintain the records prescribed in this publication are Title 10, United States Code, Chapter 857 and Executive Order 9397, Numbering System for Federal Accounts Relating to Individual Persons, November 22, 1943. Forms affected by the PA have an appropriate PA statement. System of records notice F011 AF XO A, Aviation Resource Management System (ARMS) (December 26, 2002, 67 FR 78777) applies. Paperwork Reduction Act of 1974 as amended in 1996affects this instruction. Ensure that all records created as a result of processes prescribed in this publication are maintained IAW AFMAN 37-123 (will convert to AFMAN 33-363), Management of Records and disposed of IAW the Air Force Records Disposition Schedule (RDS) located at **https://afrims.amc.af.mil**.

Chapter 1

GENERAL INFORMATION

1.1. General.

1.1.1. Scope. This volume establishes procedures applicable to the safe operation of the MQ-1 Unmanned Aircraft System. With the complementary references, this volume prescribes standard operating procedures for all pilots and sensor operators (hereafter referred to as aircrew or crewmembers) operating the MQ-1 aircraft.

1.1.2. Aircrew Responsibility. In conjunction with other governing directives, this volume prescribes procedures for MQ-1 aircraft operations under most circumstances, but it is not a substitute for sound judgment. Crewmembers may accomplish operations or use procedures not addressed in this volume if they enhance the safe and effective accomplishment of the mission.

1.1.3. Deviations. Deviations from these procedures require approval of the MAJCOM/A3 unless an emergency or operational necessity dictates otherwise.

1.1.4. Phase Manuals. Training units may develop phase manuals from procedures contained in the above documents. Phase manuals may expand on basic procedures, but they will not be less restrictive than flight manuals and applicable USAF instructions. Operational units may use phase manuals to augment mission qualification and continuation training.

1.2. Waiver Requests.

1.2.1. Unless specified otherwise, the waiver authority for all provisions of this volume is the MAJCOM/A3. Approved waivers are effective until the next AFI 11-2MQ-1 Vol. 3 rewrite unless stated otherwise in the waiver approval message.

1.2.2. Units under operational control (OPCON) of (or assigned to) a COMAFOR will request waivers from the COMAFOR.

1.3. Technical Data. Crew members will not operate new equipment or modified aircraft without validated technical data in accordance with 00-5 series Technical Orders. If tech data does not accompany new modifications delivered to the field, personnel will not operate this equipment without written authorization from the appropriate authority.

1.4. Suggested Changes. Make suggested changes or improvements to this instruction with AF Form 847, *Recommendation for Change of Publication.*

1.5. Distribution. Each aircrew member is authorized a copy of this volume.

Chapter 2

MISSION PLANNING & BRIEFING

2.1. Responsibilities. The pilot in command is responsible for mission planning and must ensure the crew is briefed prior to assuming command of the aircraft.

2.1.1. Crewmembers other than the crew flying the mission may accomplish mission planning. If necessary, mission elements and events may be modified the day of the flight or while the MQ-1 is airborne as long as changes do not compromise flight safety. The pilot will ensure all crewmembers are aware of any changes.

2.1.2. Areas covered in flight planning will include, at a minimum, weather, fuel requirements, objectives, communication procedures, and Operational Risk Management (ORM) (to include takeoff and landing data, departure and arrival procedures, and threat study when applicable).

2.2. General Procedures.

2.2.1. Standards. The SQ/CC is the approval authority for squadron standards. Group/Wing standards may be published and approved by the OG/CC.

2.2.2. Maps, Charts, and Flight Logs.

2.2.2.1. Local Area Maps. A local area map of sufficient detail to remain within assigned areas and identify potential emergency landing sites will be available for display on the PSO Tracker Display. Units will ensure the Pilot/Sensor Operator (PSO) racks contain current charts.

2.2.2.2. Enroute Charts and Approach Procedures. Pilot-in-Command (PIC) is responsible for appropriate Flight Information Publications (FLIP publications) in the Ground Control Station (GCS). Units are not required to maintain FLIP terminal instrument procedure books in the GCS except when the MQ-1 is operating from an airfield with a published MQ-1-compatible instrument approach.

2.2.2.3. Mission and Navigation Route Maps. Maps for display on the PSO tracker will be current and of sufficient scale to allow for navigation and terrain/obstacle avoidance.

2.2.2.4. Flight Logs. Crews will use AF Form 70, *Pilot's Flight Plan and Flight Log*, or approved alternate IAW AFI 11-202V3, *General Flight Rules*.

2.2.3. Flight in National Airspace (NAS). For operations within or through the National Airspace System, flight crews will ensure the projected flight path and any imposed restrictions (including divert/alternate procedures) meets the specifications of the governing FAA approval document, such as a Memo of Agreement or Certificate of Authorization.

2.3. Briefing and Debriefing.

2.3.1. Briefing Guides. Briefing guides can be found in **Attachment 2** through **6**. Use of briefing guides is not mandatory, but all applicable items in the briefing guides must be briefed by the pilot or other members of the crew. Units may augment these guides as needed.

2.3.2. Briefing Times. Briefings should be completed prior to flight.

2.3.3. Mission Brief. All crewmembers scheduled to fly will attend a mission briefing. Crewmembers not able to attend the briefing must obtain Mission Commander (MCC) or Operations Supervisor approval prior to participating in a flight. It is the pilot in command's responsibility to ensure all crewmembers are briefed.

2.3.4. Alternate mission. Brief an alternate mission for each flight if applicable.

2.3.5. Changeover Briefs. Individual crewmembers will complete a changeover brief for each crew position changeover.

2.3.6. Mission Debrief. After crew changeover or landing, all missions will be debriefed as a crew to the maximum extent possible.

Chapter 3

NORMAL OPERATING PROCEDURES

3.1. General.

3.1.1. Pilot In Command (PIC). For a crew with more than one qualified pilot, the PIC will be determined prior to assumption of aircraft control and has the responsibilities and authority as defined in AFI 11-202V3. The PIC will change during flight as pilots cycle into and out of the GCS during the mission.

3.1.2. Crewmembers participating in a mission flight will not be called out of the GCS to accomplish non-mission items. Unit commanders will ensure all crewmembers participating in missions are focused on their in-flight responsibilities and not tasked with other duties while the mission is underway.

3.1.3. The MQ-1 has no Functional Check Flight (FCF) requirement.

3.2. Ground Control Station:

3.2.1. The PIC determines crewmember and visitor seating and the number of people allowed in the GCS. Only qualified pilots or student pilots under instructor supervision may fly the MQ-1.

3.2.2. No items will be placed (checklists, charts, etc.) on the lower console that may interfere with aircraft controls or the Heads Down Displays (HDD); this restriction does not prevent placement of items on the shelf above the HDDs.

3.2.3. Smoking is prohibited in or within 50 feet of the GCS.

3.2.4. While in the GCS Crewmembers will operate only those electronic devices necessary for safety of flight or the accomplishment of the mission.

3.3. Required Equipment. The equipment listed in this paragraph and applicable items from AFI 11-202V3 (para **2.6**) are required for takeoff. If the equipment fails while airborne, the PIC will determine whether to continue the mission.

3.3.1. Two separate video sources.

3.3.2. The inertial navigation system (INS) and global positioning systems (GPS) must be operational.

3.3.3. An infrared (IR) sensor must be operational for any missions with a planned night takeoff or landing or for any mission that will be airborne through the night.

3.3.4. An operable radio suitable for mission accomplishment.

3.4. Communications. Crewmembers will use the following crew positions for intercom identification and call up: Pilot, Sensor, IP, ISO (instructor SO).

3.4.1. Ground Communications. The pilot and ground crew will ensure two-way communication are established prior to all ground checks and anytime the aircraft's engine is operating on the ground. Two-way communication will be maintained until the pilot releases the ground crew.

3.4.2. In-flight Communications.

3.4.2.1. Intercom communications will be limited to flight-critical information from commencement of the "Engine Start" checklist until completion of the "Climb" checklist and from initiation of "Arrival" checklist until completion of "Shutdown" checklist.

3.4.2.2. Crews will minimize telephone use during critical phases of flight.

3.4.2.3. Each crewmember will monitor the intercom and announce when going on or off headset.

3.4.2.4. MQ-1 crews will announce all altitudes, departing from and climbing/descending to on the intercom. This allows all crew members to monitor desired or assigned altitudes.

3.5. Checklist Usage.

3.5.1. Each crewmember will have and refer to the appropriate checklists during flight operations to ensure required actions are accomplished. The PIC will ensure appropriate checklists are completed. Electronic checklists are authorized.

3.5.2. The right seat crew member will pass all Heads Down Display (HDD) caution and warning messages to the pilot during non-critical phases of flight. Pilots will brief which HDD messages are will be relayed during critical phases of flight.

3.6. Engine Start/Taxi.

3.6.1. All engine starts require a fireguard.

3.6.2. The following apply during taxi operations.

3.6.2.1. If the pilot loses sight of the taxiway centerline, the aircraft will be stopped until visual contact with the centerline is reacquired. If the pilot cannot regain sight of the centerline, a wing walker must be in place with two-way communication established before moving the aircraft any further.

3.6.2.2. The SO will use the sensor ball to clear for obstructions during taxi operations and prior to all turns. The SO will advise the pilot prior to releasing the sensor ball from position mode.

3.6.2.3. If the pilot is using the sensor ball as the only video source for taxi and a requirement arises to use it for obstacle scanning, the pilot will bring the aircraft to a stop before releasing the sensor ball from position mode.

3.6.2.4. Maximum taxi speed is 10 knots ground speed (KGS) on a taxiway, 20 KGS on a runway, and 5 KGS in a turn.

3.7. Runway Requirements. Waiver authority for this paragraph is the OG/CC.

3.7.1. Minimum runway length is 5000 feet.

3.7.2. Minimum runway width is 75 feet.

3.7.3. Minimum taxiway width is 50 feet.

3.8. Takeoff.

3.8.1. The PIC will ensure take off and landing data (TOLD) are calculated prior to takeoff. TOLD will include the following as a minimum: rotate speed, lift-off speed, climb speed, and glide speed (engine out situations).

3.8.2. Pilots will not taxi or takeoff over a raised cable or takeoff into a raised webbing-type barrier. Pilots may takeoff beyond or between raised cables provided there is 5000 ft of runway beyond or between barriers.

3.8.3. The sensor ball will be in position mode when the aircraft is below 500 ft Above Ground Level (AGL).

3.9. Cruise.

3.9.1. The Pilot will always have flight graphics displayed.

3.9.2. The aircrew will perform operations checks at least once per hour. These checks will include fuel level, oil level, propeller pitch operation, and engine parameters at a minimum.

3.9.3. An oil level check will be conducted every 30 minutes.

3.9.4. The conduct of operations and oil level checks will not interfere with tactical or safety-of-flight operations. If required, these checks may be postponed until such time as they may be accomplished without mission degradation.

3.10. Approach and Landing.

3.10.1. The PIC will ensure the approach and landing speeds have been calculated and briefed prior to commencing the approach.

3.10.2. The sensor ball will be placed in position mode and flight graphics will be displayed on both PSO racks prior to descending below 500 feet AGL.

3.10.3. The pilot will normally accomplish a 3 degree approach.

3.10.4. The desired touchdown zone for a visual approach is 500 to 1500 feet from the threshold, or the precision approach glide path interception point. When local procedures or unique runway surface conditions require landing beyond these points, the desired touchdown zone will be adjusted accordingly and all crewmembers briefed.

3.10.5. Crewmembers will not attempt landing or touch-and-goes over raised webbing-type barriers. Pilots may land or accomplish touch-and-goes beyond raised cables provided there is 5000 feet remaining to the runway end or the next raised cable.

3.10.6. During go-around or low approaches, pilots will avoid tracking directly over aircraft on the runway.

3.10.7. Pilots will comply with wake turbulence avoidance criteria for a small aircraft (category 1) to the maximum extent possible.

3.10.8. Pilots will not attempt practice night EO nose-camera landings. Low approaches are authorized.

3.10.9. Pilots will not exceed 1200 feet per minute (FPM) descent rate on final approach and will establish normal glide path by 200 feet AGL. Descent rates greater than 600 FPM from threshold to flare require a go-around.

3.11. Above Maximum Allowable Gross Weight (MAGW) Operations. Waiver authority for above MAGW operations is the MAJCOM/A3 and/or COMAFFOR. The maximum recommended limit for above MAGW ops is 2550 pounds for Block 10 and 15 aircraft. MAGW waivers will only be considered by ACC/A3 for contingency operations.

3.11.1. Operational Risk Assessment. The primary risk associated with above MAGW operations is the increased probability of airframe damage during landing. To the maximum extent possible, aircraft will not be landed until below 2250 pounds. If circumstances require a landing above 2250 pounds (such as weather, aircraft malfunction, etc.), an emergency will be declared and the most experienced pilot available will conduct the landing. The following considerations will be evaluated when conducting above MAGW operations:

3.11.1.1. Pilot training, proficiency, and currency

3.11.1.2. Environmental conditions

3.11.1.3. Hard Landing Inspection Criteria chart from the flight manual

3.11.2. Takeoff and Landing Data (TOLD). The Aeronautical Systems Center Reconnaissance System Wing (ASC/RSW) has generated above MAGW TOLD for the flight manual which is based on engineering analysis only. ASC/RSW caveats its use as follows:

WARNING: Operating the aircraft in excess of the gross weight limit (2250 pounds) requires a separate operational waiver from an appropriate USAF authority. Operating at higher than recommended maximum allowable weight exceeds aircraft structure and performance limits. Pilots must pay special attention to weather, runway conditions and aircraft systems functionality when considering an overweight aircraft landing.

3.11.3. Above MAGW Landing Inspection Criteria. Every landing above MAGW will be documented in the AFTO Form 781 (include landing weight and sink rate). Maintenance personnel will cross-reference the AFTO Form 781 write-up with the “Hard Landing Inspection Criteria” chart from the flight manual to determine if an inspection is necessary.

3.11.4. Training. Any waiver for above MAGW operations should include guidelines to conduct takeoffs and low approaches to meet training requirements. Above MAGW landings and touch and go landings will not be practiced.

3.11.5. Aircraft Certification. Flights flown outside Restricted/Military Controlled Airspace must be IAW an approved Certificate of Authorization (COA) and require a valid airworthiness certificate. Airworthiness certification is dependent on the aircraft being flown at/below MAGW. Aircraft flights launched above MAGW invalidate the airworthiness certification and shall not be flown outside of Restricted/Military Controlled Airspace for duration of the flight. If an aircraft is flown above MAGW and normal post-flight inspection reveal no damage, the original airworthiness certificate still applies.

3.12. Fuel requirements.

3.12.1. "Joker Fuel" is defined as a pre-briefed fuel amount needed to terminate an event and proceed with the remainder of the mission.

3.12.2. "Bingo Fuel" is defined as a pre-briefed fuel amount which allows the aircraft to return to the base of intended landing or alternate (if required) using planned recovery parameters and arriving with normal recovery fuel as listed below.

3.12.2.1. "Normal Recovery Fuel" is defined as the fuel amount at the commencement of the initial approach or at the FAF at the base of intended landing or alternate (if required). This fuel amount will be 60 pounds or higher as established by local guidance.

3.12.2.2. Minimum or Emergency Fuel. Declare the following when it becomes apparent that an aircraft will commence the initial approach or start reach the FAF at the base of intended landing or alternate (if required) with:

3.12.2.2.1. Minimum Fuel: 50 pounds.

3.12.2.2.2. Emergency Fuel: 40 pounds.

3.12.3. Operations Below Normal Recovery Fuel. Aircrew will select the aft tank when total fuel is less than 60 pounds and will switch to the forward tank when the aft fuel tank quantity reaches three pounds.

Chapter 4

INSTRUMENT AND WEATHER PROCEDURES

4.1. Approach Category. The MQ-1 is an approach category A aircraft.

4.2. Ceiling and Visibility (no alternate available).

4.2.1. Operating the MQ-1 below visual flight rules minimums requires a published Airport Surveillance Radar or a Precision Approach Radar terminal approach procedure at the operating airfield. The MQ-1 INS/GPS is not certified for flying GPS instrument approaches. Pilots will comply with the following ceiling and visibility restrictions for the MQ-1 operating airfield when no alternate is available.

For Takeoff	-Worst wx (tempo or prevailing): >/= 800/2 or 500/1 above lowest compatible published app mins, (> of the two) -Forecast: >/= these mins until takeoff plus 1 hr and estimated time of arrival (ETA) +/- 2 hrs
While Airborne	-ETA +/-2, wx forecasted to drop below mins in "for takeoff" row above, plan RTB to land prior to wx deterioration and: -RTB with enough fuel to hold for an extra 4 hours, then land w/ normal rec. fuel
Anytime	-Actual wx < 3000/3, increase recovery fuel to allow aircraft to hold over field for at least 2 hours then penetrate and land with normal recovery fuel
Use the numbers in this table only when no alternate is available. Refer to AFI 11-202 Volume 3 for minimums and fuel requirements if an alternate is available.	

4.2.2. Unit commanders will ensure that appropriate resources are in place at an airfield prior to designating the airfield as an alternate.

4.3. Turbulence.

4.3.1. Do not takeoff if forecast or reported turbulence at the departure field is greater than moderate.

4.3.2. Pilots will limit exposure to turbulence to the maximum extent practical.

4.4. Winds

4.4.1. Pilots will comply with the following regarding forecast winds if no alternate is available:

4.4.1.1. Forecast winds must be within flight manual limits until takeoff plus one hour and at ETA +/-2 two hours.

4.4.1.2. While airborne, if revised forecast winds for ETA (+/-2 hours) exceed limits specified in MQ-1 flight manual, the pilot will terminate the mission in time to return the aircraft to the operating base before the forecast time of increased winds or, terminate the mission in time to return the aircraft to the operating base with sufficient fuel to hold for a minimum of four hours.

4.5. Emergency Lost Link Mission Planning. Pilots will maintain awareness of prevailing weather along the route of flight, Lost Link/Emergency Mission route of flight, and the landing field by all available means. Pilots will continually update the Emergency Mission to account for weather hazards (e.g., cloud layers, icing, turbulence, etc.) along the proposed route of flight to home station. The route will be altered if necessary using care to select appropriate aircraft parameters to avoid hazardous weather conditions and complying with Air Traffic Control clearances.

4.6. Adverse Weather Operating Procedures:

4.6.1. Rain, Snow, Freezing Precipitation, and Frost. These are defined as any moisture that can accumulate on aircraft surfaces.

4.6.1.1. General (All Configurations).

4.6.1.1.1. Pilots will not takeoff with any frost, ice, or snow accumulation on the wings. Whenever the outside air temperature is less than 40 degrees Fahrenheit (5 degrees Celsius) or there is concern about frost, crews will apply an ice retardant to the wings or inspect the aircraft for frost immediately prior to takeoff.

4.6.1.1.2. Precipitation adversely affects aircraft performance and reduces visibility. If conditions permit, pilots should minimize exposure to all types of precipitation during all phases of flight. Reference can be made to the flight manual wet-wing performance data when the aircraft is wet.

4.6.1.1.3. Pilots will not conduct flight into forecast icing greater than light and will not conduct flight into known icing conditions. If encountering icing, pilots should maneuver the aircraft to exit the icing conditions. Consideration will be given turning the EO/IR sensor aft to prevent ice formation on the lens face and thus allow use of the sensors to scan flight surfaces and the visual ice detector for ice build-up.

4.6.1.2. Anti-ice "Wet" Wing Configuration. Operations may be conducted into forecast or actual icing conditions up to and including moderate. The anti-ice system is designed to allow climbs or descents through icing conditions but is not intended for continuous operation in any icing conditions. Prior to takeoff, pilots will ensure that planned flight through forecast or actual icing will not exceed the capabilities and limitations of the anti-ice system as described in T.O. 1Q-1(M)B-1 USAF Series MQ-1B System Flight Manual. Reference will be made to the flight manual for wet-wing performance data.

4.7. Runway/Taxiway Conditions.

4.7.1. Pilots will not taxi with a runway condition reading (RCR) less than 5 and will not takeoff or land with RCR less than 12.

4.7.2. When no RCR is available, crews will refer to International Civil Aviation Organization conversions in the Flight Information Handbook.

4.7.3. The handling characteristics of the MQ-1 on ice or snow are not optimum. On ice and/or snow, pilots will minimize throttle setting to that required to move (or sustain movement of) the aircraft and limit taxi speed to no more than 5 KGS. If required to stop, pilots should plan to stop on clear portions of the taxiway, if able.

Chapter 5

AIR TO-AIR WEAPONS EMPLOYMENT

5.1. This chapter is not applicable to MQ-1 operations.

Chapter 6

AIR-TO-SURFACE OPERATIONS

6.1. General. AFI 11-214 contains air-to-surface procedures applicable to all aircraft. This chapter specifies procedures or restrictions applicable to MQ-1 operations.

6.2. Live Ordnance Procedures. For simulated deliveries with live ordnance loaded, pilot will keep the master arm SAFE and will not squeeze the trigger.

6.3. Off-Range Simulated Weapons Employment. Off-range attacks may be conducted when carrying training ordnance. Crews will not fire the laser outside of approved areas and will not perform off-range attacks with live air-to-ground ordnance loaded.

6.4. Target Identification. Crews must positively identify the target prior to weapons release. Positive identification will be accomplished by either visually acquiring the target or by confirming the target location through valid on-board/off-board cues. Crews should exercise caution and possess a high level of target situational awareness when relying on a single target cue to confirm target location.

6.5. Battle Damage and Weapons Checks. Crews will perform a battle damage/weapons check of the weapons stations prior to or during RTB following expenditure of live ordnance. If unable to complete the check using on-board sensors, crews will request support from another aircraft or a ground observer before landing.

Chapter 7

ABNORMAL OPERATING PROCEDURES

7.1. General. This chapter contains procedures to follow when other-than-normal circumstances occur. The procedures in this chapter do not replace or supersede procedures contained in the flight manual or the use of sound judgment.

7.1.1. Pilots will not accept an aircraft for flight with a malfunction that is addressed in the emergency section of the flight manual until maintenance personnel accomplish appropriate corrective actions.

7.1.2. Once a malfunctioning system is isolated, pilots will not use that system again unless its use in a degraded mode is essential for recovery. If the fault is corrected or malfunctioning item reset, crews may continue the flight or use of the system unless prohibited by the flight manual.

7.2. Ground Emergencies:

7.2.1. Pilots will not taxi the aircraft with nose-wheel steering, brake system, video, or telemetry malfunctions.

7.2.2. Ground crews using the appropriate equipment will recover an aircraft after inadvertent entry onto soft or unprepared surfaces. Pilots will not attempt to recover the aircraft to the prepared surface by using engine power and/or differential braking.

7.3. In-flight Emergencies:

7.3.1. Air Aborts. Abort the mission, regardless of apparent damage or subsequent normal operation, for any of the following: bird strike, over-G, uncommanded flight control inputs, or engine failure.

7.3.2. Armament System Malfunctions. Aircrew will not attempt to expend ordnance using an armament system with a known abnormal condition or known weapons release malfunction.

7.3.3. Forced Landing. Crews will comply with forced landing procedures in the flight manual and local guidance. If a forced landing to a runway or primary site cannot be completed without endangering personnel or property on the ground, then another site will be selected even if attempting a landing at that alternate site may result in destruction of the MQ-1 aircraft.

7.4. In-Flight Practice of Emergency Procedures.

7.4.1. Pilots will practice aborted takeoffs and unusual attitude procedures only in the flight simulator or cockpit procedures trainer.

7.4.2. Practice in-flight engine shutdown is prohibited.

7.4.3. Pattern Procedures. Initiate go-arounds from Simulated Flameout (SFO) patterns in sufficient time to ensure the aircraft does not touch down.

Chapter 8

LOCAL PROCEDURES

8.1. General. This chapter is for unit local operating procedures. Procedures herein will not be less restrictive than those contained elsewhere in this regulation, nor will this chapter be a single-source document for procedures contained in other directives or regulations. Avoid unnecessary repetition of guidance provided in other established directives; however, reference to those directives is acceptable when it serves to facilitate location of information necessary for local operating procedures.

8.2. Review. Forward an electronic copy of this chapter to ACC/A3YU, NAF/OV/DO (if applicable), and MAJCOM/A3/DO for review, comments, and required changes as appropriate. This procedure need not delay distribution.

8.3. Format. Organize the local chapter in the following format:

Introduction.

General Policy.

Mission Planning.

Ground Operations.

Flying Operations.

Local Airspace Procedures.

Abnormal Procedures.

Attachments (Illustrations).

8.4. Content. The local chapter will include procedures for the following, if applicable:

Local Area Procedures.

Controlled Emergency Landing Areas/Procedures.

Local Weather Procedures.

Approved Alternate Missions.

Unit Standards.

8.5. Forms Prescribed. None

8.6. Forms Adopted. The following Air Force forms are adopted for use in this instruction: AF Form 847, *Recommendation for Change of Publication*; and AF Form 70, *Pilot's Flight Plan and Flight Log*.

CARROL H. CHANDLER, Lt Gen, USAF
DCS, Operations, Plans & Requirements

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFPD 11-2, Aircraft Rules and Procedures, 14 January 2005

AFPD 11-4, Aviation Service, 1 September 2004

AFI 11-2MQ-1V1, MQ-1—*Crew Training*, 4 May 2007

AFI 11-2MQ-1V2, *MQ-1 Aircrew Evaluation Program, 2 Aug 2005*

T.O. 1Q-1(M)B-1, *USAF Series MQ-1B System Flight Manual,* Chg 9, 10 Aug 2007

T.O. 1Q-1(M)B-34-1, *Nonnuclear Munitions Delivery Manual, 15 Jan 2007*

AFTTP 3-3 *Predator Combat Aircraft Fundamentals MQ-1, 29 Dec 06*

AFI 11-202V3, *General Flight Rules, 5 April 2006*

AFI 33-360, Publications and Forms Management, 18 May 2006

AFMAN 37-123 (will convert to AFMAN 33-363), *Management of Records*, Aug 1994

Abbreviations and Acronyms

ACC—Air Combat Command

AF—Air Force

AGL—above ground level

AIF—Aircrew Information File

A3—Director of Air and Space Operations or Operations Officer

EEI—essential elements of information

EO—electro-optical

EP—emergency procedure

ETA—estimated time of arrival

FCIF—Flight Crew Information File

FLIP—Flight Information Publication

FPM—feet per minute

GCS—ground control station

GPS—Global Positioning System

HQ—headquarters

IAW—in accordance with

IFF—identification friend or foe

INS—inertial navigation system

IP—instructor pilot

IR—infrared

ISO—instructor sensor operator

KGS—knots ground speed

LRE—Launch and Recovery Element

MAJCOM—major command

MCE—Mission Control Element

MSA—minimum safe altitude

MUX—multiplexer

NM—nautical mile

NOTAM—Notice to Airmen

OGV—office symbol for Operations Group Standardization and Evaluation

OPR—office of primary responsibility

ORM—Operational Risk Management

PIC—Pilot in Command

PSO—Pilot/Sensor Operator

RCR—runway condition reading

ROZ—restricted operations zone

SO—sensor operator

TEMPO—temporary, term used in weather forecasts

USAF—United States Air Force

Terms

Critical Phases of Flight—Takeoff, approach, landing, and gaining handover (LRE to MCE), and live/actual weapons employment are critical phases of flight.

Minimum Crew—Minimum GCS crew to operate the MQ-1 is a single pilot. A Sensor Operator or extra pilot is required during critical phases of flight.

Phase Manual—Phase manuals are "how to" documents that expand on basic procedures in flight manuals and applicable USAF instructions. Training units may develop these manuals to enhance volume and provide student crewmembers with explanatory study material. Phase manuals provide complementary and/or more detailed aircraft maneuver or systems operation descriptions than flight manuals and/or USAF instructions.

MQ-1 Crew—The MQ-1 crew normally consists of the pilot and sensor operator.

Attachment 2

GENERAL BRIEFING GUIDE

1. Mission Overview:

a. Time Hack

b. Roll Call

c. Mission/Training Objectives

d. Pilot in Command

e. Call Sign

f. Step/start/takeoff/land/swapout times

h. Go / No Go items

i. ORM

j. Special Interest Items

2. Maintenance Information

a. Tail #

b. Configuration

c. Aircraft Status

d. Spare

e. Ramp Weight

3. Weather

a. Surface Winds

b. Ceiling and Visibility

c. Hazards

4. Airfield/Airspace

a. Airfield/Airspace NOTAMs

b. Airfield Restrictions

c. Takeoff and Landing Data

d. Enroute Airspace

e. Airspace Coordination

f. Range/Restricted Operations Zone (ROZ)

(1) Time

(2) Altitude

(3) MSA

(4) Bingo Fuel (IFR/VFR)

5. Intelligence

a. General Target Information

b. General Situation

c. Threat Analysis

d. Reporting Requirements

6. Targets/Tactics

a. Target/Waypoint #

b. Target Coordinates

c. Target Descriptions

d. EEIs

e. Threat Countertactics

f. Sensor Plan/Tactics

(1) Environmentals (sun angle, thermal cross-over, smoke, haze, fog, other obscurations, etc.)

(2) Target priorities and prosecution order

(3) Aircraft positioning

7. Crew Coordination

8. Alternate Mission

9. Collision Avoidance

10. Contingencies

a. Lost Link/Emergency Mission

b. Weather

c. System malfunctions

11. Debrief time/place

12. Supported unit debrief (if required)

Attachment 3

PILOT CHANGEOVER BRIEFING GUIDE

1. Mission Update.
2. Current Clearance.
a. Airspace.
b. Altimeter Setting.
c. Altitude Block.
d. Time Remaining.
e. High Terrain.
f. Divert Field.
g. Identification Friend or Foe (IFF)/Mode IV Settings.
3. Emergency Mission Information.
4. Initial Lost Link Heading and Altitude.
5. Current Multiplexer (MUX).
6. Data Link Configuration.
a. Status of link
b. Datalink trend information.
c. Encryption
7. Fuel Status.
8. Weather Update.
a. Enroute.
b. Recovery airfield.
9. Position of other aircraft in vicinity.
10. Aircraft/System status.
11. Complete Paperwork.
a. Log Flight Time.
b. Log Training Events.
c. Log Aircraft/GCS Write-ups.

Attachment 4

SO CHANGEOVER BRIEFING GUIDE

1. Mission Update.
2. Current Clearance.

a. Airspace.

b. Altitude Block.

c. Time Remaining.

d. High Terrain.

3. Current MUX.
4. Data Link Configuration.
5. Weather Update.
6. VCR Tapes.
7. Aircraft/systems status.
8. Current Target or Next Target Status.
9. Complete Paperwork:

a. Log Flight Time.

b. Log Training Events.

c. Log Aircraft/GCS Write-ups

Attachment 5

MISSION DEBRIEFING GUIDE

1. Ground Procedures.
2. Takeoff/Departure.
3. Enroute Procedures.
4. Recovery/Landing/After Landing.
5. General.

a. SIIs.

b. Radio Procedures.

c. Crew Discipline/Effectiveness.

6. Mission Accomplishment/Analysis.

a. Mission Reconstruction.

b. Mission Support.

c. 8mm Tape/Mission Imagery Assessment.

d. Learning Objectives Achieved.

e. Lessons Learned.

f. Recommendations for Improvement.

7. Supported units debrief/after action report
8. Objectives met?
9. Comments/Questions